CLAIMS

Insert 10/18

1. A hydraulic system for raising and lowering aircraft landing gear, the system including an actuator which is extendible and retractable to operate the landing gear, the actuator including a movable member in a casing, the movable member being moved relative to the casing in a first direction to extend the actuator when fluid under pressure is supplied to a first side of the movable member whilst fluid is exhausted from a second side of the movable member, and the movable member being moved in a second direction to retract the actuator when fluid under pressure is supplied to the second side of the movable member whilst fluid is exhausted from the first side of the movable member, and there being selector valve means selectively to supply pressurised fluid to the first or second side of the movable member, characterised in that means are provided to permit exhausted fluid from at least one of the first and second sides of the movable member to augment the supplied fluid from the selector valve means and thus be directed with the supplied fluid, to the second or first side respectively of the movable member.

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2. A system according to claim 1 characterised in that the means which permit exhausted fluid to augment the supplied fluid includes a check valve which is opened as the movable member of the actuator moves relatively in the casing in the first direction to extend the actuator and lower the landing gear.

3. A system according to claim 2 characterised in that the check valve opens to permit exhausted fluid from the second side of the movable member to augment the supplied fluid in response to the pressure of the fluid supplied to the first side of the member or in response to a pressure build up in a passage carrying exhausted fluid from the second side of the movable member.

4. A system according to claim 2 or claim 3 characterised in that closure means are provided positively to close the check valve when pressurised fluid is supplied by the selector valve to the second side of the movable member.

5. A system according to any one of the preceding claims characterised in that means are provided to relieve exhausted fluid which is not recirculated from the at least one of the first and second sides of the movable member as the movable member reaches the end of travel in the casing.

6. A hydraulic system according to any one of the preceding claims including a first fluid supply line to the first side of the movable member for supplied fluid from the selector valve means when the selector valve means is in a first position, and a second supply line to the second side of the movable member for supplied fluid from the selector valve means when the selector valve means is in a second position, and the means which permit exhausted fluid from at least one of the first and second sides of the movable member to augment the supplied fluid from the selector valve means and thus be directed with the supplied fluid, to the second or first side respectively of the movable member, permitting the exhausted fluid to flow from the second supply line to the first supply line.

7. A system according to claim 6 characterised in that the second supply line includes non-return means at least to restrict the flow of exhausted fluid from the hydraulic system.

8. A system according to claim 7 characterised in that a restrictor means is provided to enable a restricted flow of exhausted fluid which is not recirculated to by-pass the non-return means.

9. A system according to any one of the preceding claims characterised in that the selector valve means is movable to a first position to permit the flow of fluid therethrough from a source of pressurised fluid to the first side of the movable member, and to a second position to permit the flow of fluid therethrough from the source to the second side of the movable member, and to a rest position in which the source is isolated and fluid may pass from the system to tank.

10. A hydraulic system substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

11. An aircraft having landing gear which is raised and lowered by a hydraulic system according to any one of the preceding claims.

12. A valve including a valve member and a piston each received in a passage in a valve body, the valve member and piston being biased apart by resilient means such that the valve member is urged towards a valve seat towards one end of the passage, and the piston is urged towards a stop towards an opposite end of the passage, a fluid inlet and a fluid outlet, the pressure of fluid at the inlet when sufficient, acting to move the valve member against the force of the biasing means off the valve seat to permit fluid flow from the inlet, past the valve seat, to the outlet, and the piston being movable in the passage away from the stop in response to a pilot pressure delivered to a pilot pressure port of the body against the force of the biasing means to a position in the

passage in which the piston engages the valve member and restrains the valve member against movement off the valve seat in response to the inlet pressure.

13. A valve according to claim 12 characterised in that means are provided to permit fluid pressure at the outlet to be communicated to an intermediate region of the passage between the valve member and the piston at least when the piston is engaged with the stop.

14. A valve according to claim 13 characterised in that the outlet opens into the valve passage and there is a flow path for the fluid under at the outlet past and/or through the valve member to the intermediate region when the valve member is in engagement with the valve seat.

15. A valve according to any one claims 13 to 14 characterised in hat the valve is a check valve to permit the flow of exhausted fluid from at least one of the first and second sides of the movable member of the actuator of the hydraulic system according to any one of claims 1 to 11 to augment the supplied fluid from the selector valve means and thus be directed with the supplied fluid, to the second or first side respectively of the movable member.

16. A valve substantially as hereinbefore described with reference to and as shown in figure 3 of the accompanying drawings.

17. Any novel feature or novel combination of features described herein and/or in the accompanying drawings.